

NIDIS Weekly Climate, Water and Drought Assessment Summary

Upper Colorado River Basin

September 21, 2010

Precipitation and Snowpack

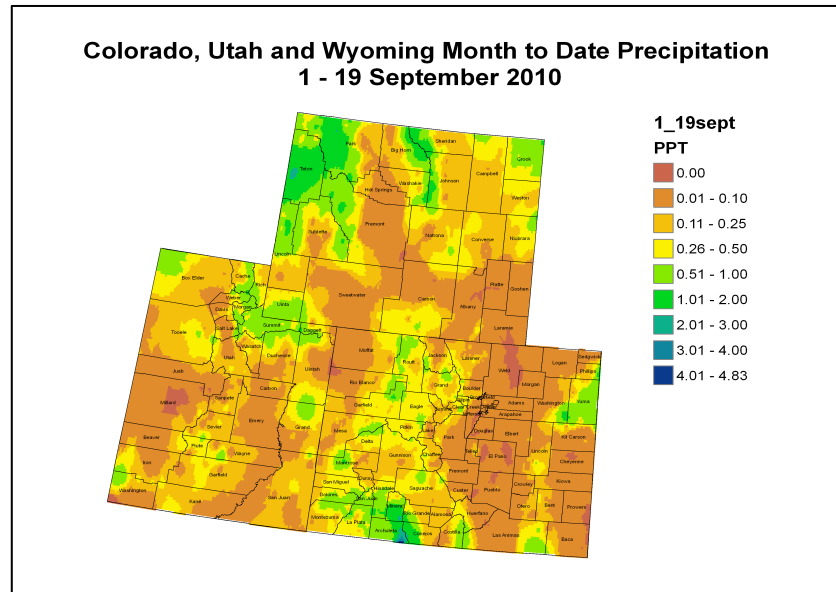


Fig. 1: September month-to-date precip in inches

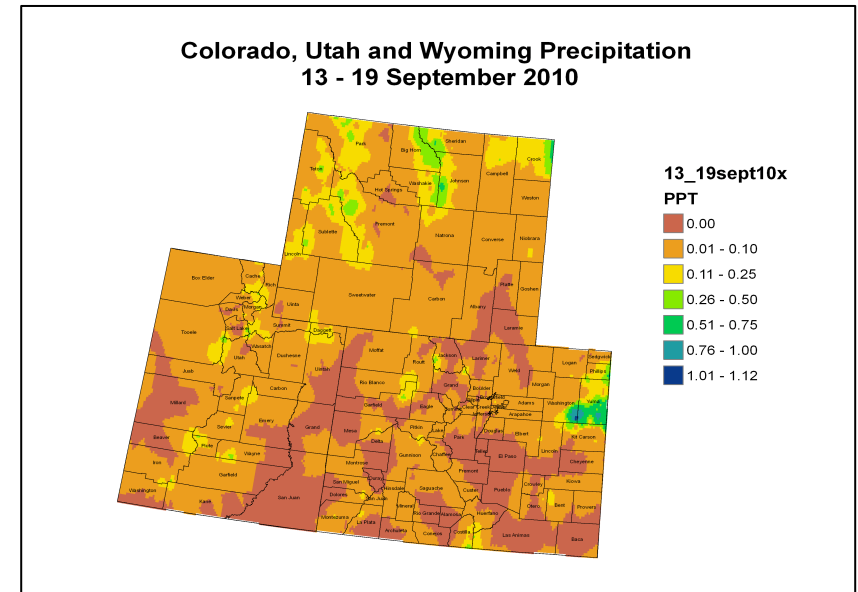


Fig. 2: September 13 – 19 precipitation in inches

After an above average August for precipitation in the Upper Colorado River Basin (UCRB), September has been much drier than average so far for most of the region. The highest amounts of precipitation, month-to-date, have fallen along the Rio Grande-San Juan basin boundary and along the northern and southern boundaries of the Upper Green River basin, with higher isolated amounts falling in the northern-central mountains of Colorado (Fig. 1).

This past week has been extremely dry across the UCRB (Fig. 2). Most of eastern Utah, and out across much of the Front Range and eastern plains of Colorado, received no precipitation. The rest of the basin received only small amounts (mostly less than a tenth of an inch). A few isolated areas in the UCRB received close to a quarter of an inch over the past week.

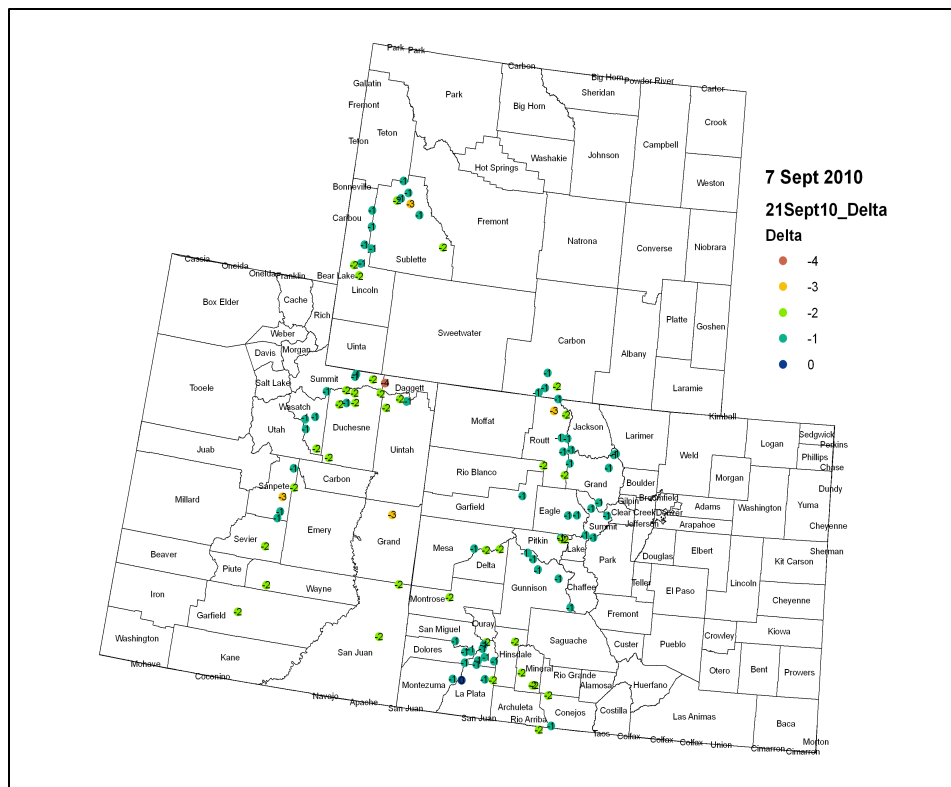


Fig. 3: SNOTEL WYTD precipitation percent of average change from last week.

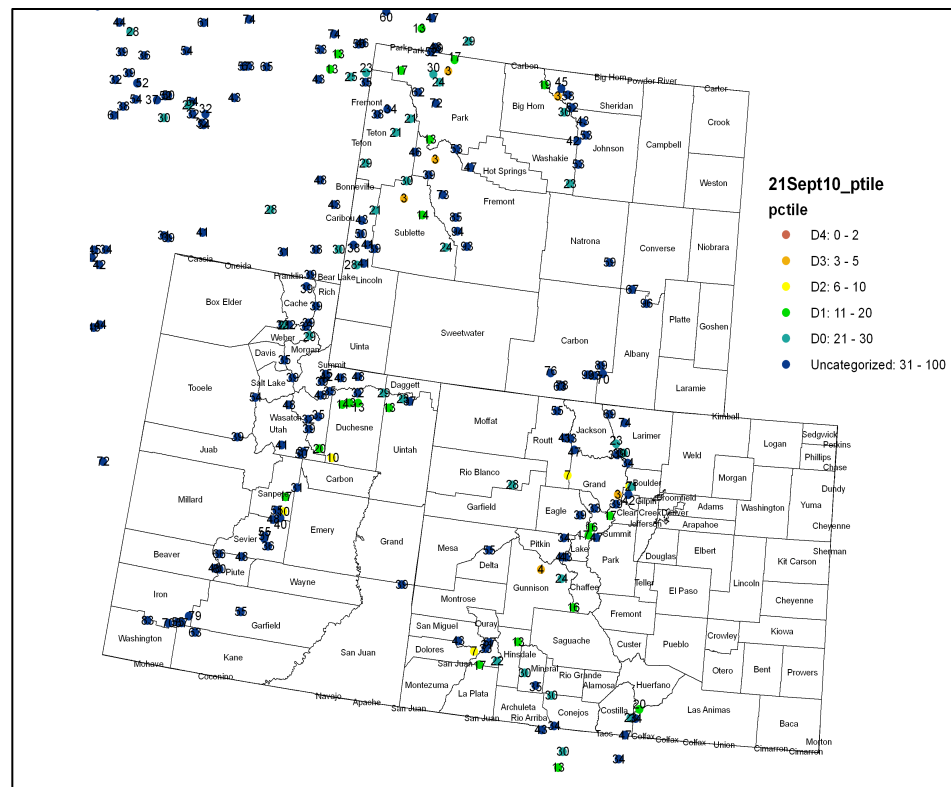


Fig. 4: SNOTEL WYTD precipitation percentiles (50% is median, 21-30% is Drought Monitor's D0 category).

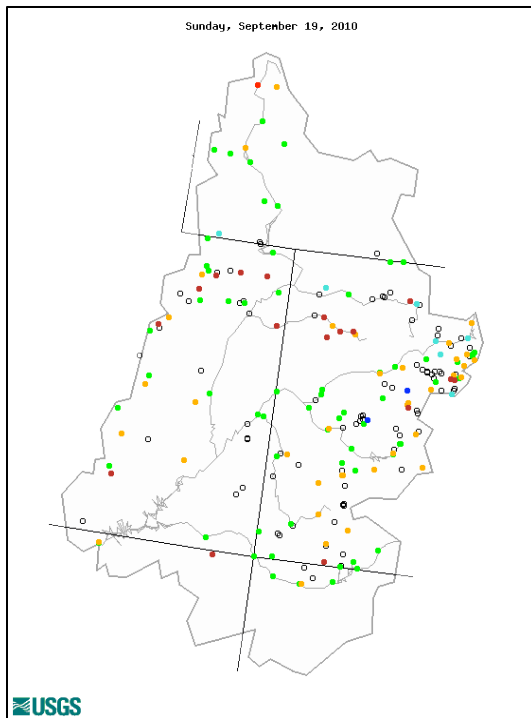
Nearing the end of the water year, weekly changes in SNOTEL water-year-to-date (WYTD) precipitation percents of average tend to be negligible. Therefore, the 2% drops from last week's WYTD precipitation percents of average across the UCRB are significant (Fig. 3). 1% decreases were seen throughout most of western CO with 2% drops along the Rio Grande-San Juan basin border and in UT and WY. No areas saw an increase as most of the basin received little to no moisture over the past week.

WYTD percentiles for the SNOTEL sites in the UCRB show the lowest values corresponding with locations of current abnormal dryness (D0 category, lower than the 30th percentile) on the U.S. Drought Monitor map—in the Rio Grande basin, the Upper and Lower Green River basins and near the Colorado headwaters region (Fig. 4). An increasing number of low percentiles have shown up in these regions over the past couple of weeks.

Streamflow

A big change this week has been seen in the USGS streamgages—just over 55% of the gages are reporting normal or above normal 7-day average streamflows as of September 19th (Fig. 5), compared to nearly 90% of streamgages reporting normal or higher 7-day average flows at the end of August. The majority of this deterioration has taken place in western Colorado, particularly near the headwaters of the Colorado River, along the White River and in the Gunnison basin.

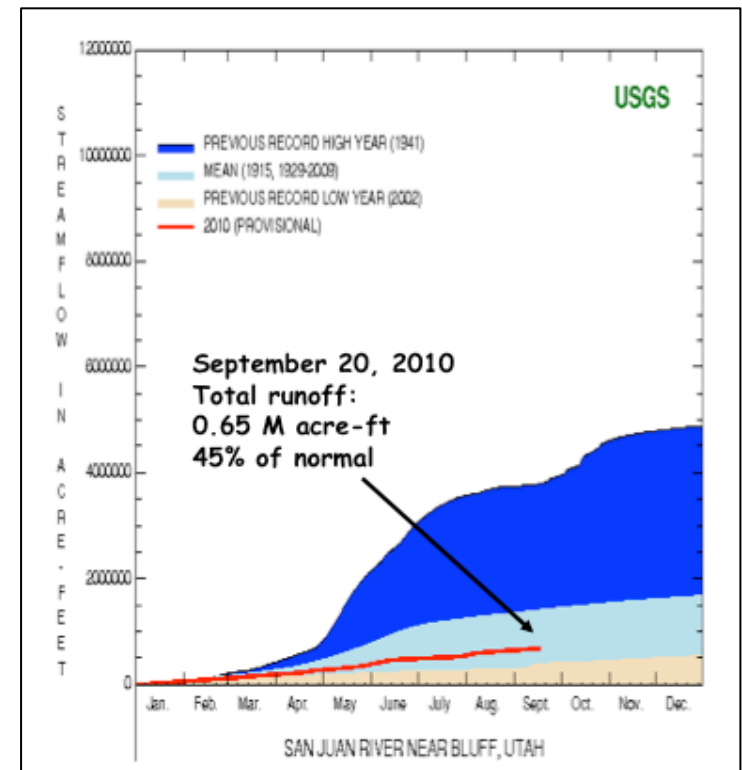
Accumulated calendar year runoff throughout the basin shows that most gages are below normal cumulative runoff levels, despite the strong resurgence in flows during the monsoon in August. Along the Colorado River at the CO-UT state line, cumulative runoff is currently at 79% of normal. On the San Juan River near Bluff, UT, cumulative runoff is at 45% of normal, mostly from the lack of spring runoff (Fig. 6).



Explanation - Percentile classes							
●	●	●	●	●	●	●	○
Low	<10	10-24	25-75	76-90	>90	High	Not-ranked
	Much below normal	Below normal	Normal	Above normal	Much above normal		

Fig. 5: USGS 7-day average streamflow compared to historical streamflow for September 19th in the UCRB.

Fig. 6: USGS Cumulative Runoff for the 2010 calendar year up to September 20th on the San Juan River near Bluff, UT.



Water Supply and Demand

Over the past week, temperatures across the UCRB were well above average (anywhere from 2° to 8°F). Soils and grasslands are currently very dry throughout the basin and surrounding regions. These very warm temperatures and dry vegetation conditions, combined with very low humidities and high winds, has led to very high fire danger for most of the month of September throughout the region.

All of the major reservoirs in the UCRB continued to see decreases in lake levels over the last week, which is normal for this time of year. Flaming Gorge and Green Mountain levels have both experienced steep declines since September 1. Lake Dillon has seen an 11,000 acre foot drop since the beginning of the month—typically lake levels only drop 6,000 acre feet from the August to September average. Lake Powell dropped about 23,000 acre feet over the past week and is around 77% of average and 63% of capacity. Fall projections suggest that inflow volumes into Lake Powell will remain below 90% of average. Overall, reservoir storage is in good shape for this time of year, and only Lake Powell and Blue Mesa are below average levels.

Precipitation Forecast

Interesting scenario setting up for this week as abundant moisture from tropical convection over Mexico is forecast to move north into the UCRB on Wednesday. Unlike the typical monsoon of mid-summer, this moisture surge will interact with a more energetic upper level environment which could change the nature of precipitation to a more widespread stratiform event instead of concentrated convective rains. In addition to the upper level dynamics, cooler air temperatures and lack of strong solar heating also favors the idea of less deep convection and more in the way of large scale moderate rains. Either way expect widespread 0.50 to 1 inch totals over the basin by late day Thursday per QPF fields, with areas in southeast Utah/southwest Colorado possibly approaching 2 inches. Dry conditions will take over by Friday and persist through the weekend. Next trough begins to dig south over the west coast by early next week, however details on the eventual path of this system are still uncertain.

Drought and Water Discussion

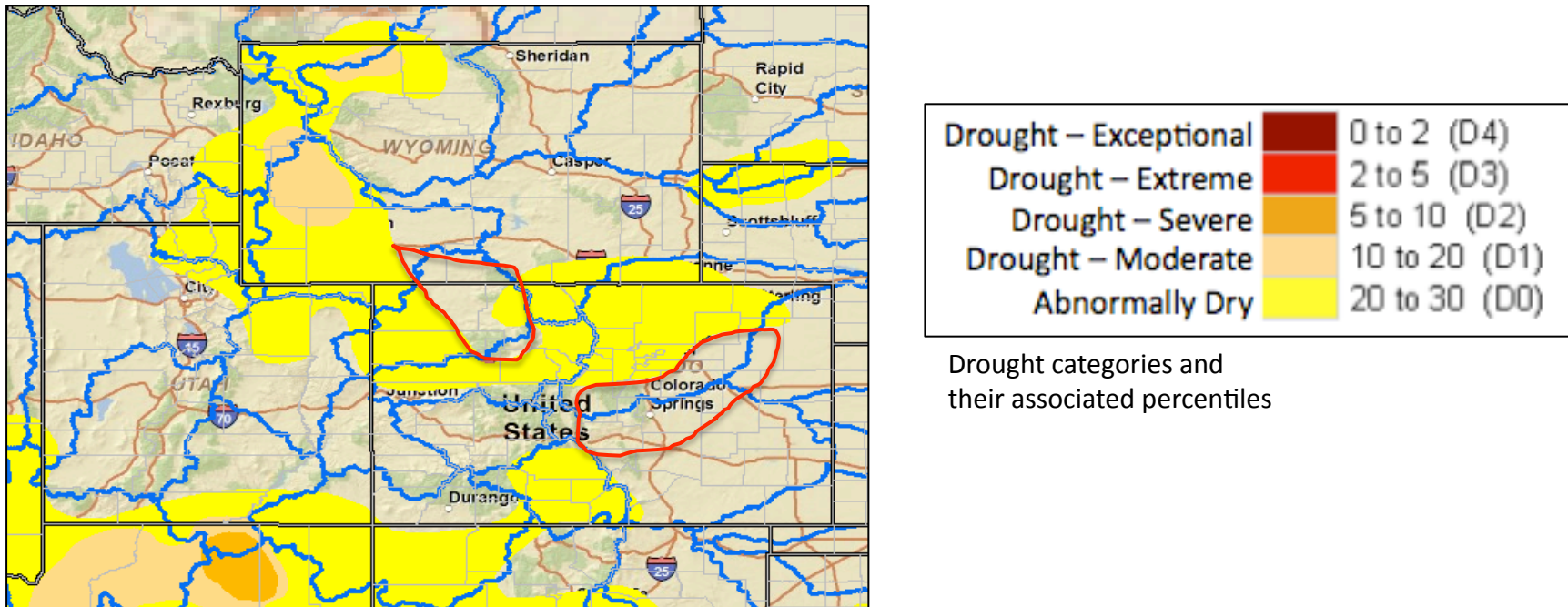


Fig. 7: September 14 release of U.S. Drought Monitor for the UCRB

Many suggestions have been made for updates to the current U.S. Drought Monitor map (Fig. 7). The DM author has expanded D0 in eastern WY and western NE to cover more of the North and South Platte basins due to dryness indicated by SPI 30 to 90 days. The Boulder WFO has suggested a major D0 expansion for the majority of the counties in the South Platte and Arkansas basins in CO due to short term dryness. 30-day precipitation is significantly below average for both basins, and 30-day SPIs are between -1.5 and -2.5. VegDRI shows dry conditions from the northeast corner of the state and following the South Platte basin boundary all the way to the Front Range. Soil moisture is short throughout this region, extending south to the Rio Grande basin. Others have suggested that D0 not be expanded to the southeastern portion of the state as that region has seen better amounts of precipitation. Several people in El Paso and Pueblo counties have requested that D0 be expanded to cover their region. It has also been suggested that we begin discussion for adding D1 along the Front Range foothills, though it has been argued that this shouldn't happen this week because of the short term nature of the abnormally dry conditions. D0 expansion should also be considered in the Yampa-White basin for continuity purposes.